REMARKS

Figures 1-4 have been amended merely to remove descriptive text beside the figure number which is provided elsewhere in the application. Claims 1, 2, 4, 5, 6, 9 and 10 are amended. Claim 3 is cancelled and new claim 11 is added. No new matter is added by virtue of the within amendments; support therefore can be found throughout the specification and in the original and previously presented claims.

The Drawings were objected to because of descriptive text appearing next to the Figure numbers. Each of the Figures has been amended to remove the noted text. Replacement and Annotated sheets are provided in **Appendix 1**. No amendment to the specification was necessitated by such amendments since the descriptive text is provided elsewhere in the application at pages 9-10.

The Specification was objected to in relation to its Abstract. The Office Action indicates that "The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art".

It is respectfully submitted that the Abstract (as it appears on page 14 of the specification) merely refers to the features of the present invention as recited in original claims 1 and 6. Thus, it is unclear what part of the Abstract is viewed as referring to 'purported merits or speculative applications of the invention'. On the contrary, it is respectfully submitted that the Abstract is in full compliance with U.S. patent law and reconsideration of the objection is requested.

Claim 9 is rejected under 35 USC §112, 2nd paragraph, for lack of antecedent basis. Claim 9 has been amended to obviate the rejection. It also is noted that the expression "LSM" in original claim 9 was a typographical error and is properly replaced by "LSC". Accordingly, amended claim 9 recites "the LSC coating solution" and new claim 11 recites "the ULSM coating solution". Withdrawal of the rejection is therefore requested.

For the sake of brevity, the remaining rejections are summarized below and are discussed in combination.

Claims 1-3 and 5-10 stand rejected under §102(b) over Herbstritt et al. (*Proceedings of the Fourth European Solid Oxide Fuel Cell Conference*, 10th – 14th July 2000, Lucerne, Switzerland, 2000, pp. 697-706 - hereinafter "Herbstritt 1").

Claims 1-6, 8 and 10 stand rejected under 35 USC §102(b) over Herbstritt et al. (*Electrochemical Society Proceedings*, Volume: 99-19, 1999, pp. 972-980 - hereinafter "Herbstritt 2").

Claims 1-3, 6 and 10 are rejected under 35 USC §102(b) over Ivers-Tiffee et al. (*Journal of the European Ceramic Society*, 2001, pp. 1805-1811).

Claim 4 stands rejected under 35 USC §103(a) over Herbstritt 1.

Claims 7 and 9 stand rejected under 35 USC §103(a) over Herbstritt 2 in view of Chen et al. (US 6,645,656).

The various rejections are discussed amply in the Office Action and the Office's position is not reiterated here, again for the sake of brevity.

Each of the rejections is traversed. The cited references, even in the noted combination, do not teach or suggest the features of the invention in any manner sufficient to sustain the rejection.

Additionally, it is noted that the claims of the application have now been amended to further define and clarify the preferred features of the invention. In particular, independent claim 1 has been amended to recite the feature "wherein a paste comprising scandium doped zirconium dioxide or doped cerium oxide (yttrium, gadolinium or samarium doped) is used as screen printing paste". Independent

process claim 10 has been amended similarly. Such feature is supported by the specification and also finds basis in former claim 3 (now cancelled).

It is respectfully submitted that the art cited does not disclose the use of a screen printing paste comprising scandium doped zirconium dioxide or doped cerium oxide. For this reason alone, the subject matter of the amended independent claims is novel.

Moreover, the electrolyte fuel cells according to amended claim 1 show unexpected improvements, in particular with respect to the stability of the area specific resistance. In order to substantiate this point, attention is directed to **Appendix 2** which shows certain experimental data. These data show a comparison of the area specific resistance of a nanoscaled LSC cathode on Gd_2O_3-doped CeO_2 (CGO) (hereinafter referred to as the "LSC / CGO system") compared with the area specific resistance of a nanoscaled LSC cathode on Y_2O_3-doped ZrO_2 (YSZ) (hereinafter referred to as the "LSC / YSZ system").

The LSC/CGO system corresponds to amended claim 1; whereas the LSC/YSZ system does not fall within the scope of amended claim 1.

More specifically, slide 1 shows the normalized area specific resistance (ASR) as a function of temperature for the LSC/CGO and LSC/YSZ systems. The diagram clearly shows that for the LSC/YSZ system, the ASR increases markedly (i.e., becomes worse) for temperatures above 500°C. In contrast, for the LSC/CGO system, the ASR remains essentially unchanged for temperatures up to at least 650°C. The increase, i.e., deterioration of the ASR for the LSC/YSZ system rapidly increases as the temperature increases. The LSC/CGO system, on the other hand, shows a markedly smaller increase of the ASR with increasing temperature, i.e., its temperature stability is significantly greater than that of the LSC/YSZ system.

Slide 2 again shows the area specific resistance as a function of temperature for the LSC/YSZ and LSC/CGO systems. In this experiment, the fuel cells were heated to a temperature of 900°C over a period of several hours, kept at that temperature for several hours and then cooled down over several hours. This heating program is shown as an insert next to the main diagram. The grey curve in the main diagram relates to the LSC/YSZ system and shows a markedly greater degradation (i.e., increase in ASR upon cooling) than the red curve for the LSC/CGO system. More specifically, the ASR for the LSC/YSZ system at the end of the heating program is at least 100 times greater than that of the LSC/CGO system.

These advantages of electrolyte fuel cells according to amended claim 1 could not have been predicted on the basis of the cited art. Therefore, the subject-matter of the amended claims is also unobvious.

Each of the §102 and §103 rejections are properly withdrawn. For example, see *In re Marshall*, 198 USPQ 344, 346 (CCPA 1978) ("[r]ejections under 35 U.S.C. §102 are proper only when the claimed subject matter is identically disclosed or described in the prior art.") Additionally, it is well-known that to establish a *prima facie* case of obviousness, three basic criteria must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference(s) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143.

There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the

cited references to make the claimed invention, nor is there a reasonable expectation of success.

Still further, the unexpected, highly superior results shown in Appendix 2 further rebut any case of *prima facie* obviousness contended.

In view of the above amendments and remarks, Applicant believes the pending application is in condition for allowance.

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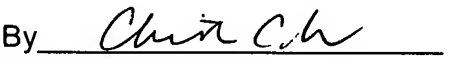
Respectfully submitted,

By 

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APPENDIX 1